WEST Search History

DATE: Tuesday, June 03, 2003

Set Name side by side	Query	Hit Count	Set Name result set
DB=USPT,PGPB; PLUR=YES; OP=ADJ			
L9	L2 not l3	5	L9
DB=JPAB,EPAB,DWPI,TDBD; PLUR=YES; OP=ADJ			
L8	GLUTAMINE and LABEL$4 and isotop$ not l7	1	L8
L7	GLUTAMINE same LABEL$4 same isotop$	2	L7
DB=USPT,PGPB; PLUR=YES; OP=ADJ			
L6	L5	2	L6
L5	L4	2	L5
L4	(5393669 or 5627044).pn.	2	L4
L3	L2 and @ad<20000515	18	L3
L2	L1 SAME ISOTOP$	23	L2
L1	GLUTAMINE WITH LABEL$4	186	L1

END OF SEARCH HISTORY

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FILE 'HOME' ENTERED AT 17:09:16 ON 03 JUN 2003

=> index bioscience
FILE 'DRUGMONOG' ACCESS NOT AUTHORIZED
COST IN U.S. DOLLARS                                  SINCE FILE      TOTAL
                                                         ENTRY    SESSION
FULL ESTIMATED COST                                       0.21       0.21

INDEX 'ADISCTI, ADISINSIGHT, ADISNEWS, AGRICOLA, ANABSTR, AQUASCI, BIOBUSINESS,
       BIOCOMMERCE, BIOSIS, BIOTECHABS, BIOTECHDS, BIOTECHNO, CABA, CANCERLIT,
       CAPLUS, CEABA-VTB, CEN, CIN, CONFSCI, CROPB, CROPU, DDFB, DDFU, DGENE,
       DRUGB, DRUGLAUNCH, DRUGMONOG2, ...' ENTERED AT 17:09:25 ON 03 JUN 2003

67 FILES IN THE FILE LIST IN STNINDEX

Enter SET DETAIL ON to see search term postings or to view
search error messages that display as 0* with SET DETAIL OFF.

=> s glutamine(s)label####(S)isotop?(S)(15 n)
          1   FILE AQUASCI
          1   FILE BIOSIS
          1   FILE BIOTECHABS
          1   FILE BIOTECHDS
          2   FILE CABA
          1   FILE CANCERLIT
  19 FILES SEARCHED...
          3   FILE EMBASE
          0*  FILE FEDRIP
  35 FILES SEARCHED...
          5   FILE LIFESCI
          2   FILE MEDLINE
          1   FILE PASCAL
  51 FILES SEARCHED...
          3   FILE SCISEARCH
          6   FILE USPATFULL
  64 FILES SEARCHED...

  12 FILES HAVE ONE OR MORE ANSWERS,   67 FILES SEARCHED IN STNINDEX

L1   QUE GLUTAMINE(S) LABEL####(S) ISOTOP?(S)(15 N)

=> s l1 and py<2001
          0*  FILE ADISINSIGHT
          1   FILE AQUASCI
   6 FILES SEARCHED...
          1   FILE BIOSIS
   9 FILES SEARCHED...
          1   FILE CABA
  13 FILES SEARCHED...
  18 FILES SEARCHED...
          0*  FILE CONFSCI
  32 FILES SEARCHED...
          0*  FILE FEDRIP
          0*  FILE FOREGE
  41 FILES SEARCHED...
          5   FILE LIFESCI
          0*  FILE MEDICONF
          2   FILE MEDLINE
  46 FILES SEARCHED...
  51 FILES SEARCHED...
          0*  FILE PHAR
          2   FILE SCISEARCH
  59 FILES SEARCHED...
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          5   FILE USPATFULL
  63 FILES SEARCHED...
  66 FILES SEARCHED...

   7 FILES HAVE ONE OR MORE ANSWERS,   67 FILES SEARCHED IN STNINDEX

L2   QUE L1 AND PY<2001

=> d rank
F1            5   LIFESCI
F2            5   USPATFULL
F3            2   MEDLINE
F4            2   SCISEARCH
F5            1   AQUASCI
F6            1   BIOSIS
F7            1   CABA


=> file f1 f3-7
COST IN U.S. DOLLARS                                SINCE FILE      TOTAL
                                                        ENTRY    SESSION
FULL ESTIMATED COST                                     14.85      15.06

FILE 'LIFESCI' ENTERED AT 17:25:40 ON 03 JUN 2003
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=> s l2
   2 FILES SEARCHED...
   4 FILES SEARCHED...
   5 FILES SEARCHED...
L3           12 L2

=> dup rem l3
PROCESSING COMPLETED FOR L3
L4            11 DUP REM L3 (1 DUPLICATE REMOVED)
                 ANSWERS '1-5' FROM FILE LIFESCI
                 ANSWERS '6-7' FROM FILE MEDLINE
                 ANSWERS '8-9' FROM FILE SCISEARCH
                 ANSWER '10' FROM FILE BIOSIS
                 ANSWER '11' FROM FILE CABA

=> d bib abs 1-11

L4   ANSWER 1 OF 11  LIFESCI    COPYRIGHT 2003 CSA      DUPLICATE 1
AN   89:113221  LIFESCI
TI   Amino acid metabolism of Lemna minor  L. 5.  super(15)N-labeling kinetics
     of the amide and amino groups of glutamine and asparagine.
AU   Rhodes, D.; Rich, P.J.; Brunk, D.G.
CS   Cent. Plant Environ. Stress Physiol., Dep. Hortic., Purdue Univ., West
     Lafayette, IN 47907, USA
```

SO PLANT PHYSIOL., (**1989**) vol. 89, no. 4, pp. 1161-1171.
DT Journal
FS L
LA English
SL English
AB A serious limitation to the use of N(O,S)-heptafluorobutyryl isobutyl amino acid derivatives in the analysis of super(**15**)**N-labeling** kinetics of amino acids in plant tissues, is that the amides **glutamine** and asparagine undergo acid hydrolysis to glutamate and aspartate, respectively, during derivatization. This led us to consider an alternative procedure for derivatization of **glutamine** and asparagine with N-methyl-N-(tert-butyldimethylsilyl)-trifluoroacetamide in pyridine. From separate analyses of the specific **isotope** abundance of the amino-N groups of asparagine and **glutamine** as their N-heptafluorobutyryl isobutyl derivatives, the specific amide-(super(**15**)**N**) abundance of these amino acids was determined. We demonstrate that this approach to super(**15**)**N** analysis of the amides can yield unique insights as to the compartmentation of asparagine and **glutamine** in vivo.

L4 ANSWER 2 OF 11 LIFESCI COPYRIGHT 2003 CSA
AN 2000:70333 LIFESCI
TI Biosynthesis of L-alanine, a major amino acid of fibroin in Samia cynthia ricini
AU Osanai, M.; Okudaira, M.; Naito, J.; Demura, M.; Asakura, T.
CS Department of Biology, Faculty of Science, Kanazawa University, Kakumamachi, 920-1164, Kanazawa, Japan
SO Insect Biochemistry and Molecular Biology [Insect Biochem. Mol. Biol.], (**20000300**) vol. 30, no. 3, pp. 225-232.
ISSN: 0965-1748.
DT Journal
FS Z
LA English
SL English
AB The derivation of alanine in fibroin was investigated using NMR and selective **isotopic labelling**. super(2)H sub(2)O infused orally into 5th instar larvae was incorporated into the proton of the methyl group of alanine in fibroin. Proton exchange among alanine, glycine and serine was also found. Incorporation of super(13)C from [2-super(13)C]acetate into alanine C2 and C3 and glycine C2 in fibroin, and also C4 of free **glutamine** plus glutamate was observed in vivo. Hemolymph contained a peak for C4 of glutamate plus **glutamine**, and an alanine C3 peak appeared transiently. Thus, it is suggested that the C-skeleton of alanine formed was derived from L-malate via the TCA-cycle, and that this alanine is utilized in part for fibroin synthesis. Spectra of the hemolymph extract of larvae infused orally with [super(**15**)**N** sub(2)]urea showed no super(**15**)**N**-compounds, whereas those of larvae injected subcutaneously showed only one peak of urea, whose intensity decreased with time, as shown in the in vivo spectra of a living larva infused with [super(**15**)**N** sub(2)]urea. The solution NMR spectrum of fibroin showed no super(**15**)**N-labelled** compounds. Temporal changes in the peak intensities of six compounds in the spectra of a living larva infused with [super(**15**)**N**]ammonium demonstrated a process in which super(**15**)**N** was incorporated into fibroin containing super(**15**)**N**-alanine through the amide group of **glutamine** and the amino group of glutamate. Thus, alanine biosynthesis from the TCA-cycle originates mainly from water, L-malate and ammonium. The fact that no super(**15**)**N**-urea was detected in the hemolymph extract of larvae infused with [super(**15**)**N**]ammonium suggests that super(**15**)**N**-urea found in the above in vivo spectra may be that accumulated in the hindgut. Thus, excess ammonium in the body causes the production of urea by the urea-cycle. In Samia larvae, urea was not reutilized but excreted. The metabolic relationships between

the assimilation of ammonium and the function of the urea-cycle are discussed.

L4 ANSWER 3 OF 11 LIFESCI COPYRIGHT 2003 CSA
AN 96:85639 LIFESCI
TI Probing the mechanism of nitrogen transfer in Escherichia coli asparagine synthetase by using heavy atom isotope effects
AU Stoker, P.W.; O'Leary, M.H.; Boehlein, S.K.; Schuster, S.M.; Richards, N.G.J.*
CS Dep. Chem., Box 117200, Univ. Florida, Gainesville, FL 32611-7200, USA
SO BIOCHEMISTRY (WASH.), (**1996**) vol. 35, no. 9, pp. 3024-3030. ISSN: 0006-2960.
DT Journal
FS J
LA English
SL English
AB In experiments aimed at determining the mechanism of nitrogen transfer in purF amidotransferase enzymes, super(13)C and super(**15**) **N** kinetic **isotope** effects have been measured for both of the **glutamine**-dependent activities of Escherichia coli asparagine synthetase B (AS-B). For the glutaminase reaction catalyzed by AS-B at pH 8.0, substitution of heavy atom **labels** in the side chain amide of the substrate yields observed values of 1.0245 and 1.0095 for the amide carbon and amide nitrogen **isotope** effects, respectively. In the **glutamine**-dependent synthesis of asparagine at pH 8.0, the amide carbon and amide nitrogen **isotope** effects have values of 1.0231 and 1.0222, respectively. We interpret these results to mean that nitrogen transfer does not proceed by the formation of free ammonia in the active site of the enzyme and probably involves a series of intermediates in which **glutamine** becomes covalently attached to aspartate. While a number of mechanisms are consistent with the observed **isotope** effects, a likely reaction pathway involves reaction of an oxyanion with beta -aspartyl-AMP. This yields an intermediate in which C-N bond cleavage gives an acylthioenzyme and a second tetrahedral intermediate. Loss of AMP from the latter gives asparagine. An alternate reaction mechanism in which asparagine is generated from an imide intermediate also appears consistent with the observed kinetic **isotope** effects.

L4 ANSWER 4 OF 11 LIFESCI COPYRIGHT 2003 CSA
AN 95:8307 LIFESCI
TI An investigation of the ligand-binding site of the glutamine-binding protein of Escherichia coli using rotational-echo double-resonance NMR
AU Hing, A.W.; Tjandra, N.; Cottam, P.F.; Schaefer, J.; Ho, C.*
CS Dep. Biol. Sci., Carnegie Mellon Univ., 4400 Fifth Ave., Pittsburgh, PA 15213, USA
SO BIOCHEMISTRY (WASH.), (**1994**) vol. 33, no. 29, pp. 8651-8661. ISSN: 0006-2960.
DT Journal
FS J
LA English
SL English
AB **Glutamine**-binding protein (GlnBP) is an essential component of the **glutamine** transport system in Escherichia coli. Rotational-echo double-resonance (REDOR) solid-state nuclear magnetic resonance (NMR) has been used to determine internuclear distances in the complex of GlnBP and its ligand, L-**glutamine**. REDOR, combined with strategically placed **isotopic labels**, is effective in obtaining model-independent internuclear distances and thus detailed structural information on the ligand-binding site of GlnBP. The existence of a single histidine residue (His156) in the binding site has provided an excellent probe for distance measurements between protein and ligand. REDOR distances up to 6.3 angstrom have been observed between super(13)C **labels** in L-**glutamine** and super(**15**)**N labels** in His156. These results have unambiguously

determined the ligand orientation with respect to the imidazole ring of His156, which is an important first step in refining the ligand-binding-site model of GlnBP in general. The measured distances were also used as constraints in restrained molecular dynamics calculations of the complex using the unliganded crystal structure of GlnBP as the starting point. The simulations clearly show consistency between calculated distances and those measured by REDOR.

L4 ANSWER 5 OF 11 LIFESCI COPYRIGHT 2003 CSA
AN 85:21014 LIFESCI
TI Pathway of ammonium assimilation in Streptomyces venezuelae examined by amino acid analyses and super(15)N nuclear magnetic resonance spectroscopy.
AU Shapiro, S.; Vining, L.C.; Laycock, M.; McInnes, A.G.; Walter, J.A.
CS Chem. Dep., Concordia Univ., Sir George Williams Camp., 1455 Ouest, Blvd. Maisonneuve, Montreal, Que. H3G 1M8, Canada
SO CAN. J. MICROBIOL., (**1985**) vol. 31, no. 7, pp. 629-634.
DT Journal
FS J
LA English
SL English; French
AB To obtain information on the route by which ammonium is incorporated into organic nitrogenous compounds in this actinomycete, the authors have used super(**15**)**N-labelled** ammonium as substrate and followed incorporation of the **isotope** by super(**15**)**N** nuclear magnetic resonance (NMR) spectrometry. The principal assimilation route was shown to involve the formation of **glutamine** and glutamate. Predominant **labelling** of alanine was observed only when suspensions of S. venezuelae were subjected to conditions restricting their oxygen supply.

L4 ANSWER 6 OF 11 MEDLINE
AN 2000389208 MEDLINE
DN 20345105 PubMed ID: 10869432
TI In vivo urea cycle flux distinguishes and correlates with phenotypic severity in disorders of the urea cycle.
AU Lee B; Yu H; Jahoor F; O'Brien W; Beaudet A L; Reeds P
CS Departments of Molecular and Human Genetics and Pediatrics and Children's Nutrition Research Center, Baylor College of Medicine, One Baylor Plaza, Houston, TX 77030, USA.. blee@bcm.tmc.edu
NC DK02407 (NIDDK)
DK54450 (NIDDK)
RR00188 (NCRR)
SO PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES OF THE UNITED STATES OF AMERICA, **(2000 Jul 5)** 97 (14) 8021-6.
Journal code: 7505876. ISSN: 0027-8424.
CY United States
DT Journal; Article; (JOURNAL ARTICLE)
LA English
FS Priority Journals
EM 200008
ED Entered STN: 20000818
Last Updated on STN: 20000818
Entered Medline: 20000810
AB Urea cycle disorders are a group of inborn errors of hepatic metabolism that result in often life-threatening hyperammonemia and hyperglutaminemia. Clinical and laboratory diagnosis of partial deficiencies during asymptomatic periods is difficult, and correlation of phenotypic severity with either genotype and/or in vitro enzyme activity is often imprecise. We hypothesized that stable isotopically determined in vivo rates of total body urea synthesis and urea cycle-specific nitrogen flux would correlate with both phenotypic severity and carrier status in patients with a variety of different enzymatic deficiencies of the urea cycle. We studied control subjects, patients, and their relatives with different enzymatic deficiencies affecting the urea cycle

while consuming a low protein diet. On a separate occasion the subjects either received a higher protein intake or were treated with an alternative route medication sodium phenylacetate/benzoate (Ucephan), or oral arginine supplementation. Total urea synthesis from all nitrogen sources was determined from [(18)O]urea **labeling**, and the utilization of peripheral nitrogen was estimated from the relative **isotopic** enrichments of [(**15**)**N**]urea and [(**15**)**N**]**glutamine** during i.v. co-infusions of [5-(amide)(**15**)**N**]**glutamine** and [(18)O]urea. The ratio of the isotopic enrichments of (15)N-urea/(15)N-glutamine distinguished normal control subjects (ratio = 0.42 +/- 0.06) from urea cycle patients with late (0.17 +/- 0.03) and neonatal (0.003 +/- 0.007) presentations irrespective of enzymatic deficiency. This index of urea cycle activity also distinguished asymptomatic heterozygous carriers of argininosuccinate synthetase deficiency (0. 22 +/- 0.03), argininosuccinate lyase deficiency (0.35 +/- 0.11), and partial ornithine transcarbamylase deficiency (0.26 +/- 0.06) from normal controls. Administration of Ucephan lowered, and arginine increased, urea synthesis to the degree predicted from their respective rates of metabolism. The (15)N-urea/(15)N-glutamine ratio is a sensitive index of in vivo urea cycle activity and correlates with clinical severity. Urea synthesis is altered by alternative route medications and arginine supplementation to the degree that is to be expected from theory. This stable isotope protocol provides a sensitive tool for evaluating the efficacy of therapeutic modalities and acts as an aid to the diagnosis and management of urea cycle patients.

L4 ANSWER 7 OF 11 MEDLINE
AN 1999436092 MEDLINE
DN 99436092 PubMed ID: 10506142
TI Studies of hepatic glutamine metabolism in the perfused rat liver with (15)N-labeled glutamine.
AU Nissim I; Brosnan M E; Yudkoff M; Brosnan J T
CS Division of Child Development, Department of Pediatrics, University of Pennsylvania School of Medicine, Philadelpia, Pennsylvania 19104, USA.
NC DK-53761 (NIDDK)
HD-34900 (NICHD)
NS-37915 (NINDS)
SO JOURNAL OF BIOLOGICAL CHEMISTRY, **(1999 Oct 8)** 274 (41) 28958-65.
Journal code: 2985121R. ISSN: 0021-9258.
CY United States
DT Journal; Article; (JOURNAL ARTICLE)
LA English
FS Priority Journals
EM 199911
ED Entered STN: 20000111
Last Updated on STN: 20000111
Entered Medline: 19991109
AB This study examines the role of glucagon and insulin in the incorporation of (**15**)**N** derived from (**15**)**N-labeled glutamine** into aspartate, citrulline and, thereby, [(**15**)**N**]urea **isotopomers**. Rat livers were perfused, in the nonrecirculating mode, with 0.3 mM NH(4)Cl and either 2-(15)N- or 5-(15)N-labeled glutamine (1 mM). The isotopic enrichment of the two nitrogenous precursor pools (ammonia and aspartate) involved in urea synthesis as well as the production of [(15)N]urea isotopomers were determined using gas chromatography-mass spectrometry. This information was used to examine the hypothesis that 5-N of glutamine is directly channeled to carbamyl phosphate (CP) synthesis. The results indicate that the predominant metabolic fate of [2-(15)N] and [5-(15)N]glutamine is incorporation into urea. Glucagon significantly stimulated the uptake of (15)N-labeled glutamine and its metabolism via phosphate-dependent glutaminase (PDG) to form U(m+1) and U(m+2) (urea containing one or two atoms of (15)N). However, insulin had little effect compared with control. The [5-(15)N]glutamine primarily entered into urea

via ammonia incorporation into CP, whereas the [2-(15)N]glutamine was predominantly incorporated via aspartate. This is evident from the relative enrichments of aspartate and of citrulline generated from each substrate. Furthermore, the data indicate that the (15)NH(3) that was generated in the mitochondria by either PDG (from 5-(15)N) or glutamate dehydrogenase (from 2-(15)N) enjoys the same partition between incorporation into CP or exit from the mitochondria. Thus, there is no evidence for preferential access for ammonia that arises by the action of PDG to carbamyl-phosphate synthetase. To the contrary, we provide strong evidence that such ammonia is metabolized without any such metabolic channeling. The glucagon-induced increase in [(15)N]urea synthesis was associated with a significant elevation in hepatic N-acetylglutamate concentration. Therefore, the hormonal regulation of [(15)N]urea isotopomer production depends upon the coordinate action of the mitochondrial PDG pathway and the synthesis of N-acetylglutamate (an obligatory activator of CP). The current study may provide the theoretical and methodological foundations for in vivo investigations of the relationship between the hepatic urea cycle enzyme activities, the flux of **(15)N-labeled glutamine** into the urea cycle, and the production of urea **isotopomers**.

L4 ANSWER 8 OF 11 SCISEARCH COPYRIGHT 2003 THOMSON ISI
AN 97:257705 SCISEARCH
GA The Genuine Article (R) Number: WP820
TI The influence of a scalar-coupled deuterium upon the relaxation of a N-15 nucleus and its possible exploitation as a probe for side-chain interactions in proteins
AU Boyd J (Reprint); Mal T K; Soffe N; Campbell I D
CS UNIV OXFORD, DEPT BIOCHEM, S PARKS RD, OXFORD OX1 3QU, ENGLAND (Reprint); UNIV OXFORD, OXFORD CTR MOL SCI, OXFORD OX1 3QU, ENGLAND
CYA ENGLAND
SO JOURNAL OF MAGNETIC RESONANCE, (**JAN 1997**) Vol. 124, No. 1, pp. 61-71.
Publisher: ACADEMIC PRESS INC JNL-COMP SUBSCRIPTIONS, 525 B ST, STE 1900, SAN DIEGO, CA 92101-4495.
ISSN: 1090-7807.
DT Article; Journal
FS PHYS; LIFE
LA English
REC Reference Count: 62
ABSTRACT IS AVAILABLE IN THE ALL AND IALL FORMATS
AB The magnitude of the quadrupole coupling constant (e(2)Qq/(h) over bar) of a deuteron is a good probe for hydrogen bonding. In protein structures, hydrogen-bonding interactions between side chains, between side chains and ligands, and between side chains and solvent are frequently found. An experiment that detects, via scalar coupling, the influence of a deuteron on the N-15 nucleus of asparagine or **glutamine** side chains is presented. The experiment depends upon the resolution of the (1) Delta(**15)N**(D) **isotope** shifts that allow the various **isotopomers** and **isotopologues** to be distinguished when N-15-**labeled** samples are dissolved in solvent mixtures of H2O/D2O. N-15 lineshapes with theoretical simulations that provide estimates for the H-2 quadrupole coupling constants are presented. The influence of N-15-H-2 dipolar-quadrupole cross correlation and the resulting small frequency shifts in the N-15 multiplet are resolved in some of the spectra. The experimental data are provided using the free amino acids asparagine and **glutamine** for which the side chains were **isotopically** enriched in N-15 and the recombinant pair of modules, fibronectin type 1 and epidermal growth factor, (F1-G) of tissue plasminogen activator, which were uniformly **isotopically** enriched in N-15. (C) 1997 Academic Press.

L4 ANSWER 9 OF 11 SCISEARCH COPYRIGHT 2003 THOMSON ISI
AN 91:395474 SCISEARCH
GA The Genuine Article (R) Number: FV584

TI ANALYSIS AND PHYSIOLOGICAL IMPLICATIONS OF RENAL 2-OXOGLUTARAMATE METABOLISM
AU NISSIM I (Reprint); WEHRLI S; STATES B; NISSIM I; YUDKOFF M
CS CHILDRENS HOSP, DIV BIOCHEM DEV & MOLEC DIS, PHILADELPHIA, PA, 19104 (Reprint); UNIV PENN, SCH MED, DEPT PEDIAT, PHILADELPHIA, PA, 19104
CYA USA
SO BIOCHEMICAL JOURNAL, (**1991**) Vol. 277, No. JUL, pp. 33-38.
DT Article; Journal
FS LIFE
LA ENGLISH
REC Reference Count: 22
ABSTRACT IS AVAILABLE IN THE ALL AND IALL FORMATS
AB The relative significance of the flux through the **glutamine** aminotransferase (glutaminase II) pathway to renal ammoniagenesis is poorly understood. A basic and unresolved question is whether 2-oxoglutaramate (2-OGM), a product of the glutaminase II reaction, is deamidated to yield 2-oxoglutarate and NH3, or whether 2-OGM accumulates as an unreactive lactam, depending on the environmental pH. In the current studies we utilized C-13 n.m.r. as well as N-**15** **n**.m.r. to demonstrate that 2-OGM occurs as a lactam, i.e. 5-hydroxypyroglutamate, regardless of the environmental pH. Our additional aims were to determine whether human kidney cells (HK cells) in culture can produce 2-OGM and to ascertain a pH-dependent relationship between NH3 and 2-OGM production from **glutamine**. We therefore developed an **isotope** dilution assay for 2-OGM utilizing 5-hydroxy[4-C-13,1-N-15]pyroglutamate as the **labelled** species. Incubations of HK cells in minimal essential medium supplemented with 1 mM-[2-N-15]**glutamine** demonstrated significantly higher production of 2-OGM at pH 6.8 and lower production at pH 7.6 compared with pH 7.4. Similarly both (NH3)-N-15 and [N-15]alanine formation were significantly higher in acute acidosis (pH 6.8) and lower in acute alkalosis (pH 7.6) compared with that at physiological pH. Addition of 1 mM-amino-oxyacetate to the incubation medium at pH 7.4 significantly diminished [N-15]alanine and 2-OGM production, but the production of (NH3)-N-15 via the glutamate dehydrogenase pathway was significantly stimulated. The current observations indicate that the glutaminase II pathway plays a minor role and that flux through glutamate dehydrogenase is the predominant site for regulation of ammoniagenesis in human kidney.

L4 ANSWER 10 OF 11 BIOSIS COPYRIGHT 2003 BIOLOGICAL ABSTRACTS INC.
AN 1997:120623 BIOSIS
DN PREV199799427126
TI Quantitation of metabolic compartmentation in hyperammonemic brain by natural abundance 13C-NMR detection of 13C-15N coupling patterns and isotopic shifts.
AU Lapidot, Aviva (1); Gopher, Asher
CS (1) William and Lee Abrahamowitz Professorial Chair Macromolecular Biophysics, Dep. Organic Chemistry, Weizmann Inst. Sci., IL-76100 Rehovot Israel
SO European Journal of Biochemistry, (1997) Vol. 243, No. 3, pp. 597-604. ISSN: 0014-2956.
DT Article
LA English
AB In the present study, the removal of cerebral ammonia by **glutamine** synthetase (GS) and by reductive amination of 2-oxoglutarate by glutamate dehydrogenase in the presence of an amino donor group was determined in hyperammonemic rabbit brains. The 15N enrichments of brain metabolite alpha-amino and amide positions of **glutamine**, glutamate, and alanine were determined by the indirect detection of 15N-**labeled** compounds of the 13C-15N spin coupling patterns of natural abundance 13C-NMR spectra. The 13C-NMR spectra of brain extracts were obtained from rabbits infused with 15NH-4Cl with or without intraperitoneal infusion of the GS inhibitor, L-methionine DL-sulfoximine, in a reasonable acquisition time period. When 15NH-4Cl was infused, (5-15N)**glutamine** and (2-15N)**glutamine** concentrations reached 5.2 mu-mol/100 mg

protein and 3.6 mu-mol/100 mg protein, respectively, which indicates the relatively high activity of reductive amination of 2-oxoglutarate in the glutamate dehydrogenase reaction. The low concentration of (2-15N)-glutamate, which is about 30% of that of (2-15N)**glutamine** obtained in this study, suggests that very little **glutamine** serves as a precursor of neuronal glutamate. When GS was inhibited by L-methionine DL-sulfoximine, a flux of 15NH-4+ via the residual activity of GS was accompanied by an apparent increase of (2-**15-N**)glutamate and (15N)alanine concentrations (2.9 mu-mol/100 mg protein and 1.8 mu-mol/100 mg protein, respectively). These findings and those obtained from 13C-13C **isotopomer** analysis (Lapidot and Gopher, 1994b) suggest that astrocytic 2-oxoglutarate is partially utilized (together with an amino croup donor) as a precursor for neuronal glutamate in the hyperammonemic brain when GS is inhibited. This process can partly replace GS activity in metabolizing ammonia in the hyperammonemic rabbit brain.

L4 ANSWER 11 OF 11 CABA COPYRIGHT 2003 CABI
AN 93:37509 CABA
DN 930320264
TI Kinetics of 15NH4+ assimilation in tomato plants: evidence for 15NH4+ assimilation via GDH in tomato roots
AU Magalhaes, J. R.
CS EMBRAPA/CNPMS, C. Postal 151, Sete Lagoas, Minas Gerais, Brazil.
SO Journal of Plant Nutrition, (**1991**) Vol. 14, No. 12, pp. 1341-1353. 29 ref.
ISSN: 0190-4167
DT Journal
LA English
AB The kinetics of 15NH4+ assimilation into free amino acids and total reduced N were monitored in both roots and shoots of 2-week-old tomato (cv. Campbell 1327) seedlings supplied with 5 mM of 99% (15NH4)2SO4 via the aerated root medium in hydroponic culture, in the presence and absence of a 2-h pre-incubation with 1 mM methionine sulfoximine (MSX), an inhibitor of **glutamine** synthetase. In the presence of MSX, 3 amino acids (glutamate, alanine and gamma -amino butyrate (GABA)) of the root tissue continued to become **labelled** with **15 N** under conditions where **labelling** of the amino-N moiety of **glutamine** was completely inhibited. This indicates primary ammonia assimilation via GDH [glutamate dehydrogenase] , or alternatively, assimilation of ammonia into alanine via alanine dehydrogenase. Free ammonia accumulated rapidly in both shoots and roots in response to MSX. It seemed that the **labelled** ammonia accumulated in the roots in the presence of MSX must be largely derived from the medium whereas in shoots this ammonia appeared to be derived from catabolism of unlabelled amino acids and proteins. The pools of **glutamine**, glutamate and alanine after 24-h exposure to 15NH4+ were, on average, 5- to 10-fold lower in the MSX-treated than in the control (-MSX) shoots and roots. In contrast, the pools of valine, leucine, isoleucine, proline, threonine, phenylalanine, lysine, and tyrosine increased 5- to 10-fold above the control values in the shoots of MSX-treated plants, and 2- to 4-fold above control values in the roots of MSX-treated plants after 24 h. The latter amino acids all exhibited low **isotope** abundance, and presumably were derived from protein turnover.

=> log y

COST IN U.S. DOLLARS	SINCE FILE ENTRY	TOTAL SESSION
FULL ESTIMATED COST	0.36	44.33

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